

Crosswords

As you surely know by now, Lea likes logic puzzles a lot. As soon as she finished solving all the Sudokus in the SUKODU 42, she went out again and bought the CROSSCON - “Crosswords for the Connaisseur”. Then she declared she would lock herself up in her room until all those were solved, too.

Unfortunately, those crosswords turned out to be quite hard. Now Lea is really hungry, but she doesn’t want to go out and grab some food until all crosswords have been solved.

Can you help her find solutions to all problems before she starves herself to death?

Input

The first line of the input contains an integer t . t test cases follow, each of them separated by a blank line.

Each test case starts with a line containing three integers $x, y, amount$. y lines follow, each consisting of x characters. A blocked field is denoted by “+”, an empty field is denoted by “_”.

$amount$ lines follow, each line containing a word consisting of letters from “a” to “z”.

Output

Your task is to solve the crossword by filling in the empty fields such that every horizontal and vertical word with length 2 or more is contained in the list of words (Note that words can be used more than once or not at all).

For each test case, output one line containing “Case # i :” where i is its number, starting at 1.

Output y more lines containing the solved crossword in the same format as given in the input with each “_” replaced by a suitable character. Each line of the output should end with a line break.

If several solutions exist any of them will be accepted.

Constraints

- $1 \leq t \leq 20$
- $1 \leq x \leq 250$
- $1 \leq y \leq 250$
- $0 \leq amount \leq 200$

Sample Input 1

```
2
5 4 4
+ _ + _ +
_____
+ _ ++ _
+ _ ++ _
hi
music
tuna
can

8 8 4
+++ _____
+++ _ +++++
_____ + ++
+++ _ +++++
+ _____ +++++
+++ _ +++++
+++ _ +++++
+ _____ ++
sword
axe
stiletto
flail
```

Sample Output 1

```
Case #1:
+t+h+
music
+n++a
+a++n

Case #2:
+++sword
+++t++++
flail+++
+++l++++
+axe++++
+++t++++
+++t++++
+sword++
```

Sample Input 2

```
2
6 6 4
++_+++
+ _____ +
____ + _
+ _ ++ _ +
+ _____ +
++_+++
pain
nice
pal
id

6 5 9
+_++++
+ _____ ++
_____ ++
+ _____ +
+++ _ ++
ear
eve
red
dead
deal
grow
move
weak
week
```

Sample Output 2

```
Case #1:
++p+++
+pain+
pal+id
+i++c+
+nice+
++d+++

Case #2:
+g++++
+red++
move++
+weak+
+++l++
```